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Performance Specification 1 - Specifications &
Test Procedures for Opacity Continuous Emissions
Monitoring Systems in Stationary Sources
Summary of Comments and Responses

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Performance Specification 1 - Specifications and Test Procedures for Opacity Continuous Emissions Monitoring Systems in Stationary Sources - Summary of Comments and Responses

Emission Measurement Branch
Emission Standards and Engineering Division

U.S. ENVIRONMENTAL PROTECTION AGENCY
Office of Air, Noise, and Radiation
Office of Air Quality Planning and Standards
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October 1982

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This document addresses the public comments submitted after proposal of Performance Specification 1 in the Federal Register. Changes made as the result of these comments are included. This document serves as the basis for the revisions made in Specification 1 between proposal and promulgation.

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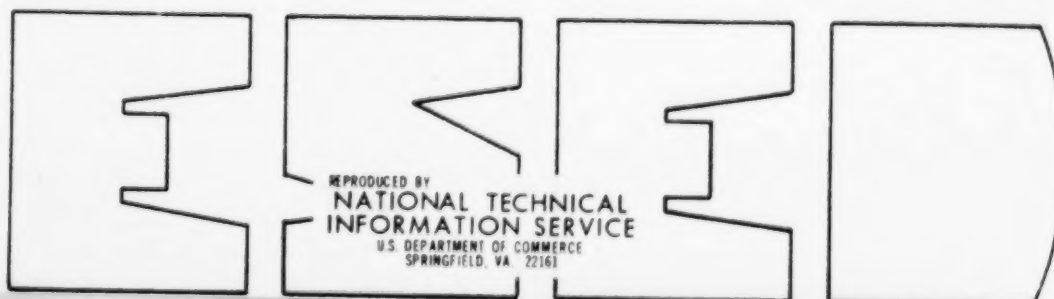
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CHAPTER 1

Introduction

Performance Specification 1 - Specifications and Test Procedures for Opacity Continuous Emission Monitoring Systems in Stationary Sources - was first promulgated in the Federal Register (40 FR 64250) on October 6, 1975. Revisions to this specification were proposed on October 10, 1979, in the Federal Register (44 FR 58602). Prior to the proposal of the revisions, copies of the proposal were distributed for comment to the Environmental Protection Agency (EPA) regional offices, State and local air pollution control agencies, manufacturers of continuous emission monitoring equipment, and concerned industries. Comments from these sources were considered, and amendments were made before the proposal.

A public comment period from October 10, 1979, to December 10, 1979, was originally set following the proposal. The deadline for public comments was extended to February 11, 1980. In all, 23 comment letters were received. The comments received along with EPA's responses are summarized in this document. The summary of comments and responses serves as a basis for most of the revisions that have been made to the test methods between proposal and promulgation. Some changes to the proposed Performance Specification (PS) 1 are based on information obtained by EPA from additional experience with the procedures.

CHAPTER 2

Summary of Changes Since Proposal

Several significant changes to Section 60.13 have been included since proposal of the revisions to PS 1. One of the more important

of these concerns the applicability of the new PS 1. Section 60.13 of 40 CFR Part 60 has been revised to specify that PS 1 applies to all new monitors installed on or after the promulgation date and further specifies which sections do not apply to existing monitors. If an existing monitor is modified or moved, the revision notes how the new PS should be applied.

Other changes to Section 60.13 clarify the reporting requirements for multiple monitors and for the number of values used in the average.

Several changes have been made to PS 1 since proposal. Most of the changes were made to clarify procedural and design specification issues raised by commenters following proposal. One significant change involves the location requirements. More flexibility in the location of transmissometers in horizontal ducts is permitted. Figures have been added to the method to clarify the specifications as to location of transmissometers in most conceivable situations.

Procedures for determining alternative locations were clarified, and the limit for acceptance was modified to allow for this determination under conditions of very low opacity.

Some of the design specifications that had been made more restrictive in the proposed revisions were returned to the original values. For example, the spectral response of between 515 and 586 nm in the proposal was returned to the 500- to 600-nm range found in the

original PS 1. The Agency reviewed this proposed change and the ones for angles of view and projection, and determined that little increase in data accuracy or reliability was gained with the more restrictive limits. In addition, some presently available transmissometers would fail to meet some or all of the more restrictive limits.

An external calibration filter access has been added to PS 1 as an option. The Agency is developing quality assurance procedures for continuous monitors that will contain periodic audits for accuracy with external filters. A transmissometer equipped with access for external calibration filters will greatly facilitate this type of assessment.

Specific changes to PS 1 made since proposal are listed by section number below:

1. Section 2.7. Mean Spectral Response. The definition of the mean spectral response was changed to be consistent with the calculating procedure.

2. Section 2.18.2. Emission Outlet Path Length. The procedure for calculating the equivalent outlet path length for noncircular stacks was added to this section.

3. Section 3.2. Calibration Attenuators. This section was revised to specify attenuators of sufficient size to attenuate the entire received beam, instead of the entire projected beam.

4. Section 3.3. Upscale Calibration Value Attenuator. The required range for the filter was changed to a value greater than

or equal to the applicable opacity standard, but less than or equal to one-half the instrument span value.

5. Section 3.4. Calibration Spectrophotometer. The accuracy of the spectrophotometer specified as ≤ 0.5 percent transmittance has been retained, but the provision that the instrument calibration be National Bureau of Standards traceable was added.

6. Section 4. Installation Specifications. This section was edited to delete the specific requirement that "A measurement path that represents the average opacity over the cross section" is used. The specifications still require an installation where the opacity measurements are "representative" of the total emissions.

7. Section 4.2. Measurement Path. This section was changed to require a measurement path passing through the centroidal area comprising 25 percent of the total cross-sectional area of the duct. Figures 1-1 to 1-5 were added to clarify measurement path requirements.

8. Section 4.2.1. Locating Requirements. This section was divided into two separate sections.

9. Section 4.2.4. Horizontal ducts. This section was changed to require the monitor to be located in a position between one-third and one-half the distance up the vertical axis. Previously, the monitor was required to be mounted one-third the distance up the vertical axis.

10. Section 4.2.5. Horizontal Ducts (multiple bends). Same as Section 1.8, above.

11. Section 4.3. Alternate Locations and Measurement Paths. Previously, this section stated that the average opacity at an alternative location should be within ± 10 percent of the average opacity value measured at an acceptable location. This criterion has been modified to ± 10 percent or 2 percent opacity, whichever is greater. This section now specifically states that alternative procedures for determining acceptable measurement locations may be used, if approved by the Administrator.

12. Section 5. Design Specifications. Section 5 (Design Specifications) and Section 7 (Performance Specifications) have been combined into a single section.

13. Section 5.1.1. Spectral Response. The design specification for the mean and peak spectral responses has been changed to between 500 and 600 nm (from between 515 and 585 nm).

14. Section 5.1.2. Angle of View. The design specification for the angle of view has been changed from 4 to 5 degrees.

15. Section 5.1.3. Angle of Projection. The design specification for the angle of projection has been changed from 4 to 5 degrees.

16. Section 5.1.4. Optical Alignment Sight. The requirement for an optical alignment sight for "zero pipe" systems was deleted, where these systems are capable of an absolute across stack zero while maintaining the same optical alignment during the measurement and calibration.

17. Section 5.1.7. Automatic Zero Compensation Indicator.

The requirement for an indicator to show that a compensation of 4 ± 0.5 percent opacity is exceeded was revised to require an indicator to show when 4 percent opacity has been exceeded.

18. Section 5.1.9. External Calibration Filter Access

(optional). An additional design specification has been recommended to permit external checks in order to assess the precision and accuracy of the monitoring data.

19. Table 1-1. Performance Specifications. The specification

for the recorder resolution was changed to less than or equal to 0.5 percent opacity.

20. Section 6. Design Specifications Verification Procedures.

The calculation instructions (Section 9) were combined with the appropriate paragraphs in Section 6.

21. Section 6.2. Angle of View. In order to be consistent

with the change in design specification (4 to 5 degrees), the performance specification procedures have been slightly changed; the specified 4 and 24 centimeters used during the procedures have been changed to 5 and 30 centimeters, respectively.

22. Section 6.3. Angle of Projection. Same changes as 1.19,

above.

23. Section 7. Performance Specification Verification

Procedure. This section has been clarified to specify that the verification tests are conducted with the data recording system to be used during monitoring.

24. Section 7.1.1. Equipment Preparation. A requirement has been added for actually measuring the monitor path length to be used in the installation (the distance calculated from drawings is not sufficient). Additional criteria for aligning the instrument during the preliminary adjustments are added; i.e., the instrument is to be aligned so that maximum instrument response is obtained prior to zero alignment.

25. Table 1-2. Required Calibration Attenuator Values. This table has been expanded to include span values of 40 percent opacity.

26. Section 7.1.3. Attenuator Calibration. The requirement for checking 75 percent of the attenuator area was deleted; checking several different portions of the attenuator is required.

27. Section 7.1.4. Calibration Error Test. This section was revised to require that only the entire beam received by the detector must pass through the calibration attenuator (instead of the entire projected beam). Additionally, the specification that the attenuators be placed in the measurement beam was clarified. Measurements taken in the instrument housing are not permitted unless the manufacturer receives prior approval from the Administrator.

28. Section 7.2.1. Optical and Zero Alignment. A recommendation was added suggesting that a "clear stack" condition be verified prior to conducting the zero alignment.

29. Section 7.4. Operational Test Period. This section was reworded to clarify that all adjustments, realignments, and lens cleanings during the operational test period must be logged.

30. Section 7.4.1. Zero Drift Test. The calculating procedures from Section 9 were combined with this section.

31. Section 7.4.2. Upscale Drift Test. The calculating procedures from Section 9 were combined with this section.

32. Table 1-3, t Values. The t value for n=8 has been corrected (correct value is 2.365).

33. Section 8.4, Equation 15. Equation 15 has been corrected. The correct equation is $D_2 = D_1 (L_2/L_1)$.

34. Section 9.1(f). General Information. This section, requiring the date of monitor manufacture to be reported, has been added.

35. Section 9.2(h). Design Specification Test Results. This section has been added, requiring reporting of the serial number and date of manufacture of the monitor tested to show compliance with the design specifications when a manufacturer's certificate of conformance was provided.

36. Section 10. Retest. This section was rewritten to clarify what portion(s) of the performance test must be repeated when the instrument fails the test.

CHAPTER 3

Summary of Comments and Responses

The list of commenting organizations is shown in Table 2-1 of this chapter. Twenty-three letters contained comments on proposed Performance Specification 1. The comments and issues and the responses to them are discussed in this chapter.

Commenters IV-D-1, et al.

1.1 Comment: The requirement of 0.5 percent full-scale resolutions for the recording system is ambiguous, since no criteria were given for measuring this value, and it is overly restrictive. Is the correct value 5.0 as stated in the preamble or 0.5 as stated in the regulation?

Response: The requirement has been clarified to specify a resolution of 0.5 percent opacity. This means that for an application using a strip chart recorder with a 100 percent opacity span value on the instrument, the recorder would be required to have 100 division so that the operator could extrapolate to 0.5 division (0.5 percent opacity).

Commenter IV-D-3

3.1 Comment: Equation 1-5 is incorrect and should be written as $D_2 = D_1 (L_2/L_1)$.

Response: This equation was corrected.

3.2 Comment: Sections 4.2.1 and 4.2.2 (monitor locations) are redundant.

Response: Although these sections are similar, Section 4.2.1 gives the appropriate monitor location when a single bend is involved, whereas Section 4.2.2 gives the appropriate location for a monitor between two bends.

3.3 Comment: The transmissometer used for comparison testing to determine alternate locations must be specified to meet the requirements of the specification. Would a portable monitor which does not measure the full stack diameter be acceptable for comparison testing?

Response: The transmissometers should meet the design criteria of this specification and should be properly calibrated. The requirement for 24-hour calibration systems is unnecessary. With the portable unit, one must consider the application. Use of a transmissometer, which does not measure the entire diameter of a circular duct, is inappropriate for determining whether stratification exists across a particular location of that duct. On the other hand, if the portable transmissometer is used in a horizontal duct where stratification is expected only along the vertical axis, it may not be necessary to measure completely across the duct to determine whether stratification exists. Good engineering judgment should be used when determining the test criteria.

Commenter IV-D-5, et al.

5.1 Comment: As stated in the summary of the proposed regulation, PS 1 would apply to instruments already installed. This would mean relocating and changing monitors because of the location specifications and additional requirements (e.g., alignment sight, upscale calibration values). This will result in significant expenditures with no improvement in accuracy, reliability, or enforcement capability of those instruments.

Response: The Agency (EPA) agrees with this comment. Paragraph 60.13 of 40 CFR 60 has been changed stating that transmissometers prior to the promulgation date of this revised PS 1 will be exempted from certain specifications. Upon replacement of an existing monitor with a new system, the revised PS will apply except the new monitor may be located at the old measurement location, regardless of whether that location meets the new requirements. If a new location is determined in such a case, the new location must also meet the new specifications.

5.2 Comment: There is no justification for requiring monitoring in the lower or upper portions of horizontal ducts. Locating the monitor at the midpoint should be permitted. This will allow measurement of opacity and gaseous pollutant concentrations from the same location.

Response: EPA changed the specification for horizontal ducts to locate the monitor somewhere between the midpoint and upper (or lower) third of the duct. This change will provide greater flexibility.

5.3 Comment: The proposed criteria for demonstrating acceptable alternate locations are not stringent enough and additional information (e.g., effect of temporal and process changes) must be taken into consideration.

Response: The overall purpose of the monitor location specifications is to provide some basic requirement to simplify the task of locating the monitor. In like manner, the procedure for determining alternative locations is to provide guidelines for determining that a gross stratification problem does not exist in an alternative location requested by the source or by the Agency. As such, EPA feels this procedure is adequate for determining whether an alternative location is acceptable.

5.4 Comment: The requirement for an alignment sight should be deleted on zero pipe units since an absolute zero is checked.

Response: The Agency agrees that an alignment sight for some zero pipe models would not be necessary when the instrument is capable of providing an absolute zero check with effluent present while maintaining the same optical alignment during measurement and calibration. Section 5.1.4 has been revised to reflect this change.

5.5 Comment: The 90 percent requirement for slotted tubes is restrictive; 66 percent is sufficient. The 90 percent requirement is ambiguous, since the technical definition of "monitor path length" indicates that the slotted length for a purged slotted tube system would always be 100 percent of the depth of the effluent.

Response: The Agency does not have sufficient data comparing measurements over short and total path lengths. The responsibility lies with the facility to show that a shortened path length is adequate. The intent of the provision is to require 90 percent of the effluent stream (as measured between duct walls) to be monitored. Section 5.1.8 has been reworded to properly reflect this intent. Commenter IV-D-6, et al.

6.1 Comment: Which of the two different angles of view/projection - 3 or 4 degrees - is correct? An angle of 3 degrees would cause a large portion of the existing monitors not to meet this specification and would cause alignment problems.

Response: A 4-degree value was intended for proposal. After reconsideration, the advantage gained by tightening this specification from 5 to 4 degrees was deemed to be small; therefore, the Agency has decided to retain the present 5-degree values for the angle of view and angle of projection.

6.2 Comment: The amount of automatic zero compensation should not be included in the calculation of zero drift. This is no more

valid than requiring the reporting of automatic compensation for other drift factors such as temperatures and voltages.

Response: The amount of automatic zero compensation (for dirt accumulation) must be taken into account during the zero drift calculation. Measurement of zero drift after compensation would be inappropriate since the drift would always appear to be zero. The basic operating principle of the automatic zero compensation is simply to reset the instrument response to zero if a nonzero value is obtained during zero calibration. For dual pass instruments this compensation is based on "dirt accumulation" on the transmitter/receiver unit and assumes the dirt accumulation on the reflector unit to be equal; therefore, this correction may not be accurate. On the other hand, other automatic compensations (line voltage drifts, etc.) are normally handled by balancing electronic signals in the operating unit. If incorrect compensation is made, this would show up as zero drift during the zero calibration check (in the same manner as if no correction were made for drift).

6.3 Comment: Provisions should be made to accept measured instead of calculated spectral response data to determine compliance with the spectral response design specification.

Response: Section 1.1 of PS 1 allows alternative procedures. There should be no problem with receiving permission to use this approach. Nonetheless, Section 6.1 has been revised to state explicitly that

the monitor spectral response characteristics may be determined by laboratory measurement.

6.4 Comment: The requirement for an alignment sight needs to be clarified. The requirement is inadequate and must include testing both lateral and rotational misalignment for both the transceiver and reflector units.

Response: The specification has been clarified. Since no units currently provide means for checking rotational misalignment on the reflector end, EPA feels that it is not practical to require an indicator to be provided for this type of misalignment. If the unit is properly calibrated and installed, any bias due to rotational misalignment would be positive. Therefore, proper procedures during calibration and installation will be required in order to reduce the effects of rotational misalignment. Section 7.1.1 requires that during the preliminary equipment setup the rotational alignment is adjusted to produce the maximum instrument output.

6.5 Comment: The calibration error test should permit placing the calibration attenuators inside the instrument housing.

Response: The Agency feels the attenuators should be placed in the actual effluent measurement path in order to assure accurate results. Alternative procedures are acceptable upon approval of the Administrator.

6.6 Comment: Including the calibration error test and response test as part of the operational test period implies these tests should be conducted during the 168-hour test period. It is better to conduct these tests off the stack at the manufacturer's facility.

Response: The calibration error and response tests are not included as part of the operational test period, but as part of the preliminary adjustments and tests. The introduction to this section specifically states that these tests may be conducted at the manufacturer's facility.

6.7 Comment: Sections 9.10.3(g) on lens cleaning clock time and 9.10.3(h) on optical alignment adjustment clock time are not clear.

Response: These sections simply mean that if any lens cleaning or alignments are made during the performance test, the time the action was taken is to be reported.

6.8 Comment: The "retest" requirements are unclear and could be misinterpreted as to what tests must actually be repeated if the monitor fails the 168-hour operational test period.

Response: This section was reworded to indicate that, in general, only the 168-hour operational test period should be repeated (after corrective measures have been taken) if the monitor fails the initial operational test period. However, if significant changes are made to the monitoring system (e.g., light source, photodetector, major

electronic components), it may be necessary to repeat the preliminary performance tests. Judgment must be used in determining which tests are to be repeated.

Commenter VI-D-9

9.1 Comment: Section 7.2.2 (optical and zero alignment-- alternative procedure) should refer to the optical alignment sight for verifying proper alignment.

Response: This section has been reworded to clarify the importance of proper alignment. Reference has been made to use of the optical alignment sight.

9.2 Comment: The optical alignment of the instrument should be performed during the initial equipment preparation (Section 7.1.1) and prior to the initial zero alignment.

Response: This comment is correct. This instruction has been added to the procedure.

9.3 Comment: The recorder system to be used during monitoring is often not used with the monitor during the performance test. Procedures should be established for handling this situation when it occurs, or this situation should be specifically prohibited.

Response: The definition of the continuous emission monitoring system (CEMS) (Section 2.1) implies that the data recorder is to be included in the performance testing. This is certainly the intent of the specification; however, the Agency

feels it is impractical to prohibit specifically the use of a substitute data recorder. Section 7 has been revised to state explicitly that prior approval of the Administrator is required if different data systems are used during the performance test and monitoring.

9.4 Comment: The manufacture date of the affected monitor should be reported; in addition, if a manufacturer's certificate of conformance is used to show compliance with design specifications, the serial number and date of manufacture of the monitor actually tested should be reported.

Response: The suggested information has been added to the reporting requirements (Section 9).

9.5 Comment: The correct monitor path length is critical to the proper zero alignment of the instrument when the final zero alignment is conducted off-stack (alternative procedure). Consequently, the monitor path length should be measured, rather than estimated from plant drawings.

Response: The Agency agrees. A requirement that the monitor path length be measured prior to conducting an off-stack zero alignment has been added to Section 7.1.1.

Commenter VI-D-14

14.1 Comment: The allowable misalignment should be specified in Table 1.1 as a performance specification.

Response: The criterion for an alignment sight is a design specification. The intent is to provide a quality control check for the facilities to determine if and when alignment might be a problem at a specific source. Note that any misalignment will cause a positive bias. The Agency does not feel it is necessary to require an alignment specification for the 168-hour operational test period.

14.2 Comment: Table 1-2 lists the calibration filters to be used for span values of 50 percent or greater. Since, at least one regulation has been proposed with a 40 percent span value, the table should be expanded.

Response: The table has been expanded.

14.3 Comment: An additional performance specification should be added to assess the relative accuracy of the CEMS as compared to EPA Method 9. This is appropriate since the CEMS is designed to substitute for the visible emission observer.

Response: This comment is not appropriate because the opacity CEMS is intended as a tool for continuously assessing the effectiveness of operation and maintenance practices of the control system and not as a substitute for visual observations, which are used to determine compliance with opacity standards.

14.4 Comment: Equations 1-2 and 1-3 are incorrectly labeled as 2-1 and 2-2.

Response: The equations' identifications have been corrected.

Commenter IV-D-17

17.1 Comment: How is the outlet path length calculated for noncircular stacks?

Response: The calculation is for the hydraulic diameter, i.e.,

$$D = \frac{2LW}{L+W}$$

This equation has been added to Section 2.18.2.

17.2 Comment: Specifications must be written for determining whether an instrument responds to ambient light.

Response: The Agency feels that sound judgment based on an analysis of the instrument design, location, and operation is sufficient to determine if an instrument output is affected by ambient light.

17.3 Comment: The criterion of ± 10 percent for determining acceptable alternative locations is too restrictive for low level opacities. A minimum acceptable difference of 1 percent opacity is suggested.

Response: The Agency agrees. The specification has been rewritten with a criteria of ± 10 percent or 2 percent opacity, whichever is greater.

17.4 Comment: The angle of view/projection procedure does not provide adequate measurement precision.

Response: The Agency feels the procedure is adequate, but alternative procedures may be approved, if requested.

17.5 Comment: No specifications are provided for the photodetector used in the angle of projection test (e.g., detector linearity). Since photodetectors can be extremely nonlinear, the angle of projection test can have erroneous results.

Response: Again, the Agency feels details of this sort should be left up to the manufacturer. Note that photovoltaic cells are generally linear in the range of low-level illumination, but become nonlinear as the illumination level increases (cell saturation). Consequently, use of a cell in the nonlinear range would be to the manufacturer's disadvantage since the output at wider angles would appear as a greater percentage of the maximum output, resulting in an apparent larger angle of view.

17.6 Comment: Alternative angle of view test procedures should be written for instruments using modulated light sources since the photodetector will not respond to a nonmodulated light source.

Response: The Agency position is that design test procedures are best handled by the manufacturer of the instrument. The purpose of the procedure in PS 1 is to provide basic guidelines.

17.7 Comment: The optical alignment specification test should allow the option of performing the design test at the installed path length, rather than at 8 meters; 8 meters is excessively restrictive for short path lengths.

Response: The specification is intended as an instrument design specification, not as a performance specification; therefore, a standard criterion for all instruments is inappropriate. In fact, this approach should simplify matters for the affected facilities since the instrument vendor can conduct this test at its laboratory and can certify that the design criterion is met.

17.8 Comment: Is the upscale calibration attenuator subject to the attenuator calibration procedures (Section 8.1.3, proposed regulation)? The upscale calibration attenuator does not provide the fundamental calibration of the instrument and, therefore, should not need to meet the stringent calibration procedure; it serves as a stability check providing a means of checking instrument response once the unit is in operation. The 3-month recertification requirement of the calibration procedures should specifically not apply to the upscale attenuator, since this would require the attenuator be removed from the monitoring unit at 3-month intervals.

Response: The Agency agrees. The fundamental calibration (and linearity) of the instrument is determined by the calibration attenuators (low, medium, and high range). The upscale calibration

value is provided as a means of assuring the instrument response (calibration) remains constant over an extended time period. Consequently, once the instrument has been properly calibrated, the upscale calibration value can be measured by the calibrated monitoring system and recorded. This value then becomes the reference by which the calibration drift is measured. Note, however, that this procedure requires the upscale calibration value to be established on an instrument that is properly calibrated with the certified attenuators. Furthermore, the specification requires that these calibrations be conducted on a path-corrected basis and with the actual monitoring system data recorder.

17.9 Comment: The definition of the mean spectral response does not support the normal procedures used for calculating this value; i.e., the calculation normally used actually determines the first moment of the spectral response distribution, not the wavelength which bisects the total area under the effective spectral response curve.

Response: The definition of the mean spectral response has been changed to be consistent with the calculations normally used (i.e., calculation of the arithmetic mean value).

Commenter IV-D-19

19.1 Comment: The indicator for the amount of automatic zero compensation (dirt accumulation) should not be required since the

initial operational test period adequately defines the required cleaning frequency.

Response: The Agency position is that if automatic compensation for dirt accumulation is permitted, it is reasonable to require some form of indicator to assure that the compensation does not become excessive.

Commenter IV-D-20

20.1 Comment: The upscale calibration attenuator value should be specified at the level of the standard instead of a level higher than the standard. This better quantifies the accuracy near the value of the standard.

Response: The criteria have been changed to require an upscale calibration value equal to or greater than the opacity standard, but less than or equal to one-half the instrument span value. Stipulating a calibration value at the level of the standard might pose a problem in cases of a low standard, i.e., accurate attenuators may not be available. The range permitted by the specification will provide a reasonable amount of flexibility in choosing the calibration value.

20.2 Comment: An additional performance specification should be added to assess the accuracy of the transmissometer relative to EPA Method 9 as the transmissometer is designed to substitute for the visible emission observer.

Response: See response 14.3.

20.3 Comment: The t value for N=8 in Table 1-3 should be 2.365, not 2.385.

Response: The value has been corrected.

Commenter IV-D-22

22.1 Comment: Requiring the monitor to be placed downstream of all particulate control systems except where condensed water vapor is not present may preclude installation after scrubbers where supersaturated conditions exist. Furthermore, 40 CFR 60.47a(a) (Subpart Da) requires the monitor to be installed upstream of the flue gas desulfurization (FGD). Yet, in this case the opacity monitor would provide no value in determining compliance with the particulate opacity standard of Section 60.42a(b).

Response: It is true that monitors may be precluded from use after scrubbers when condensed water vapor is present. Regarding the provisions of subpart Da, the monitor is not intended to be used for determining compliance with the particulate opacity standard; EPA Method 9 is the reference test method. The purpose of the monitor placed before the FGD but after the primary particulate control system is to determine the effectiveness of control system operation and maintenance practices.

22.2 Comment: The calibration procedure for the attenuators is not adequate; the calibration must be traceable to NBS standards.

Response: The specified accuracy of the calibration spectrophotometer of ± 2 percent opacity implies some standard is used for instrument calibration. The specification has been changed to require spectrophotometer calibration that is NBS traceable.

Commenter IV-D-27

27.1 Comment: The optical sight indicator is not required on transmissometers that use a zero-pipe in determining zero and calibration conditions.

Response: See Response 5.4.

27.2 Comment: The requirement for a 90 percent or greater optical path for systems with slotted tubes should be reduced to 67 percent.

Response: See Response 5.5.

Commenter IV-D-29

29.1 Comment: The 3-month recalibration requirement for calibration attenuators is excessive and not necessary. The requirement for checking 75 percent of the filter surface area is excessive.

Response: The Agency does not feel 3 months is excessive; the need for recalibration probably depends heavily on the type of

attenuator, frequency of use, and care in handling. If data are available to show less frequent calibrations are required, a change in procedure could be requested from the Administrator. The criterion for measuring 75 percent of the surface area has been deleted from the specification, and the requirement for checking several quadrants has been added.

Commenter IV-D-31

31.1 Comment: Why was the zero offset deleted?

Response: The zero offset was deleted because some monitoring CEMS cannot be offset because of the electronics of the system. The Agency felt the offset was not required because any negative zero drift that does not show up when an offset is not being used will appear as a negative span drift.

31.2 Comment: There should be some criteria for determining whether a clear stack condition exists prior to conducting an in-situ zero alignment, e.g., using an instantaneous mode of data output and noting whether fluctuations occur in the measured values.

Response: The Agency does not feel it is necessary to require specific criteria for a clear stack determination; however, a suggestion that careful thought be given to assuring that a zero stack condition exists has been added to this section.

31.3 Comment: Why was the requirement for a 1-year zero realignment deleted?

Response: The 1-year zero realignment is actually a quality assurance procedure and not a system performance specification. For this reason, the requirement was deleted from the specification. The requirement for a routine check of zero alignment will be considered for inclusion in quality assurance guidelines for monitors.

Commenter IV-D-33

33.1 Comment: Opacity monitors (transmissometers) may not be the best instrument for certain monitoring application (e.g., baghouses). PS 1 should include provisions for allowing other types of monitors such as light backscattering, laser, and beta-ray absorption instruments.

Response: The purpose of PS 1 is to provide performance and design specifications for transmissometers. It is true that transmissometers may not provide the best monitoring data for certain types of facilities. The EPA Office of Research and Development is currently evaluating different types of instrumentation. Once these monitors have been evaluated and it is determined that they provide adequate monitoring data, specifications for the new instrumentation will be written.

It should be noted that Section 60.13(g)(8) of the regulation 40 CFR 60 states that alternative monitoring systems (not meeting PS 1) may be used if the system is "adequately demonstrated to show a definite and consistent relationship between its measurements and the measurement of opacity by a system complying with Performance Specification 1."

Commenter IV-D-34

34.1 Comment: The specification of 4-percent opacity automatic compensation with an accuracy of ± 0.5 percent opacity is restrictive; it is sufficient to state a not-to-exceed 4-percent compensation. If this is done, the indicator can be set to activate at a lower capacity, say 3 percent.

Response: The Agency agrees. The specification has been rewritten to reflect the fact that the intent is simply to have an indicator activate when compensation exceeds 4 percent opacity during normal operation. However, it must be noted that for units with automatic compensation, the specification requires that the amount of compensation be accounted for during the 24-hour zero drift test.

34.2 Comment: The specification which states that the filter must attenuate the entire projected beam at or as near the midpoint of the effluent stream as is practical will sometimes require excessively large filters to be used.

Response: The procedure has been reworded to require attenuation of the entire beam received by the detector. Note that the proposed specification does state the measurement should be made as near the midpoint as is practical. The intent of this specification is to require the calibration to be conducted in the measurement path, not in the instrument housing. If the instrument manufacturer recommends a procedure wherein the attenuators are placed inside the instrument housing, the manufacturer must provide data showing the alternative procedure is acceptable.

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED
PERFORMANCE SPECIFICATION 1
DOCKET OAQPS 79-4

<u>Document Number</u>	<u>Commenter</u>
IV D-1	J.F. Cole Shell Oil Company
D-3	Richard H. Baldwin Air Pollution Control District County of San Diego
5	David J. Williamson Pacific Gas and Electric Company
6	David J. Lester Lear Siegler, Inc.
8	Neil S. Grigg N.C. Department of Natural Resources and Community Development
9	James H. Bricker, Jr. EPA, Region IV, Surveillance and Analysis Division
12	William O. Parker, Jr. Duke Power Company
14	J.F. Cochrane J.R. Simplot Company
15	J.C. Edwards Eastman Kodak Company
16	Morris L. Brechmer Virginia Electric and Power Company
17	F. William Brownwell Hunton and Williams (Utility Air Regulatory Group)
18	G.V. Welk Northern States Power Company
19	J.M. Reinke Ford Motor Company

TABLE 2-1. LIST OF COMMENTERS ON PROPOSED
PERFORMANCE SPECIFICATION 1
DOCKET OAQPS 79-4
(Continued)

<u>Document Number</u>	<u>Commenter</u>
IV D-20	John D. Janak Texas Utilities Services
22	Herbert Wortreich State of New Jersey Department of Environmental Protection
24	William O. Parker, Jr. Duke Power Company
25	James H. Rathlesberger U.S. Department of Interior
27	Alan E. Opel Environmental Data Corporation
28	Neil S. Grigg North Carolina Department of Natural Resources and Community Development
29	Mohamed T. El-Ashry Tennessee Valley Authority
31	John W. Prohaska South Carolina Department of Health and Environmental Control
33	Ralph D. Groteliveschen Deere and Company
34	Richard J. Wyers Contraves-Goerz Corporation